

Global Positioning System Exercises

Student Directions: Students are to complete the following GPS exercises. Students may work alone or in groups, depending on the number of students to GPS units available. Each group is to sign up for a geocaching account at Geocaching.com and to keep a log of their activities on the site. Make sure to include pictures of each activity. Students will be graded on 1) their ability to keep up their account, 2) difficulty of caches and benchmarks found, 3) summary and pictures provided for each activity.

Cycle 1: Introduction to GPS and Locating the Walker School

- Become familiar with the GPS unit you have by checking it out at <http://www.gramin.com> if you are using the school's unit, or another site if you have your own unit.
- Use Google Earth to locate the coordinates of the school
- Use the GPS unit to "ground truth" the coordinates of the school

Cycle 2: Setting up a Geocaching Account and Finding a Benchmark

- Set up a geocaching Account at <http://www.geocaching.com>
- Check out some of the different types of benchmarks that are located within 10 miles of the school.
- Use the GPS Unit to find the benchmark. Take a picture of the benchmark and note your location. (Note: An easy one to find is at the top of Kennesaw Mountain.)
- Record in your trip log on Geocaching.com

Cycle 3: Tracks and Waypoints

- Meet at the open field in Kennesaw Mountain.
- Set your GPS unit to create a track.
- During the track record each orange marker as waypoints.
- Use your GPS unit to find your way back to the original waypoint.

Cycle 4: GOTO a Single Cache

- Find the coordinates of a cache you want to find from Geocaching.com.
- Review your GPS book and learn how to insert coordinates.
- Use the GOTO function to help you navigate to the cache.
- Take a picture of the location.
- Record in your trip log on Geocaching.com

Cycle 5: Single Cache

- Same as Cycle 4, but choose a more difficult level.

Cycle 6: Working with the Compass and Altimeter

- Bring clothes to go on a long hiking trip at the mountain. Be prepared to go through the brush.
- Review your GPS book and learn how to use the compass and altimeter.
- Start a track at the beginning of the hike.
- During our hike make a paper record your location, our direction, and our altitude.
- Use your data to answer the following questions:
 - What was our starting altitude and direction?
 - As we hiked the trail, how many times did our compass direction change and to what point?
 - Where was our starting location in relation to each compass change?
 - What was our highest and lowest altitude?
 - What is the difference in altitude?

Cycle 7: Setting up a Geocache

- Study various types of geocaching at <http://www.geocaching.com>
- Devise a geocaching site close to home or the school.
- Purchase a Travel Bug and place it in the site (optional).
- Register your geocaching site with <http://www.geocaching.com>.

Cycle 8: Finding a Lost and Injured Person

- Peter Sullivan, a extreme sportsman is injured at the mountain and needs rescuing.
- Obtain his reported coordinates from the instructor.
- Attempt to use the radio to interview him in order to determine his injuries.
- Enter his last know coordinates in the GPS unit and use the GOTO function to find him.
- Evaluate his condition by using the NOLS patient assessment guide.
- Determine how he could be extracted with the equipment you have on hand, with out increasing his injuries
- Take a picture of the location.
- Record in your trip log on Geocaching.com

Cycle 9 and 10: Find a Multi-Cache

- Study various types of Multi-Caches at <http://www.geocaching.com>
- Try to pick one that has a puzzle, or some historical component to it. Try to pick one that is 3 stars or less.
- Use the GOTO function to find each part of the cache.
- Take a picture of the location.
- Record in your trip log on Geocaching.com

Cycles 11 and 12: Find a Multi-Cache

- Same as Cycles 9 and 10, but choose a more difficult one.

Cycle 12: Mystery Cache

- Study various types of Mystery Caches at <http://www.geocaching.com>
- Try to pick one that is 3 stars or less.
- Use the GOTO function to find each part of the cache.
- Take a picture of the location.
- Record in your trip log on Geocaching.com

Extra Credit – International Cache In Trash Out Event Day (April 14th)

- Organize or participate in this event.
- For information go to <http://www.cacheintrashout.org/>
- Make a movie of the event and show to class.

Grading Rubric

Group and Names: _____

Item	Points Possible	Points Earned
Group found Location of School.	3	
Group appropriately set up Geocaching Account and Didn't Forget Logon Information.	5	
Group found a USGS Survey Disk.	5	
Group found another type of benchmark.	7	
Both team members are able to make a track and use waypoints.	10	
Both team members are able to use the altimeter and compass effectively.	10	
Both team members are able to use the GOTO function to find a cache.	10	
Group found Single Cache	5	
Group found Multi Cache	10	
Group was able to find a lost person.	10	
Group set up there own cache site.	15	
Group found a Mystery Cache	15	
Group found Confluence Point	15	
Group found a cache above a difficult level of a 3.0	20	

Total: _____ out of 100 pts.

Note: Students may complete any of the following exercises or repeat a number of exercises, such as completing more than one single cache, in order to gain 100 points. All exercises must be documented within the group's online geocaching account. No credit will be given unless the instructor is present, and or images have been taken to document the find.

Sample Data Chart

Name: _____ (Team Member #1)

Name: _____ (Team Member #2)

Cycle	Type and Name	Date Completed	Notes
1.	Location of Walker School	Found on January 11, 2007	Coordinates matched those displayed on Google Earth.
2.	Geocache Account Setup	Set up on January 22, 2007	Account Information: coopert@thewalkerschool.org / pswd: dog1234
3.	Benchmark - Marietta ATT Microwave Tower	Found on January 31, 2007	USGS marker was on top of the tower. We were not able to take a picture of it. Tower is blocked by a fence.
4.	Tracks and Waypoints	Completed track on February 6, 2007	Marked track from Kennesaw Mt. Visitor Center to top of mountain. Took 5 waypoints, and images at each site. Also made a map of track as a back up to the unit.
5.	Single Cache – An Inspiration to All Youth	Attempted, but not found on February 15, 2007	Distance was reported as 2.1 mi from Walker at a difficulty level of 1.5. Appeared to have collected the correct information and that our calculations were correct, but did not find the cache. Cache was reportedly in 35mm film can.
6.	Single Cache or Benchmark (Altimeter Exercise) – Kennesaw Reset	Found on February 26, 2007	Found benchmark at the top of Kennesaw mountain in a round concrete monument. It's was a USGS marker. It's altitude was 1806 m.
7.	Confluence Point	Found on March 16, 2007	Closest confluence point was not within 10 miles of the school, so we elected to find the a point where either a longitude or latitude line was at "0" on our unit.
8.	Finding a Lost Person	Found on March 27, 2007	We were asked to find a injured hiker. The hiker reported is coordinates as N xx and W xx. We found the hiker at "N xx and W xx". The reported coordinates were off by 300 ft.
9.	Multi-Cache (Part I) – Dead Angle	First part of cache completed on April 12, 2007	This cached is reported as 4.3 mi from the school. It's difficulty level is 2.5. Were we able to find the first part of the cache at coordinates N xx and W xx and collect the information. It was on the back of a stop sign.
10.	Multi-Cache (Part II)	Second part of cached completed on April 23, 2007	This week we took the information from Part I which gave us the coordinates for the second part of the cache at N xx and W xx.
11.	Mystery Cache – Not completed. Multi-Cache – One of Theses Days	Found on May 2, 2007	We decided to complete an easy mult-cache for our last one instead of a mystery cache. Distance from the school is reported as 7.5 mi. with a difficulty level of 1.5. There was a lot of swag in the ammo can. We traded a Starbucks Gift card for one of the toys.

Total: _____ out of 100 pts.